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and the author less fundamental, we can look forward with lively anticipation to the next issue.

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La sécurité du travail dans l'industrie. (Moyens préventifs contre les accidents d'usines et d'ateliers.) By PAUL RAZOUS. Paris: Vve Ch. Dunod, 1901.

THIS book is devoted to a discussion of means and methods to be applied in industrial establishments in order to guard their employees against accidents. As basis for his work, the author has taken the factory laws of March 10, 1894, and those of April 30, 1880, and June 29, 1886, regulating the use of stationary and portable steam-generating apparatus (pp. 5-19). The meaning and object of each section of the law are discussed, their application to the various industries explained, and directions are given how to conform to the spirit of the regulation.

In chaps. i to v (pp. 21-199) factory buildings, their motors, machinery, and mechanical appliances are considered. We learn that in compliance with the various sections of the laws, motors, flywheels, shafting, pulleys, hoist- and hatchways, stairways and landings, vats and pans, wherever so situated as to be a source of danger to working people, must be railed or fenced in. Two hundred and five cuts illustrate practical safety devices for all sorts of machinery. Useful shields for gearing and friction-cones, safety couplings and collars with protected set-screws are shown, and their application explained. There are designs for automatic doors and safety catches for elevators, and formulæ by which to determine the safe running speed of pulleys and the diameter of shafting. Considerable importance and space are given to woodworking machinery (pp. 123-170), and numerous safeguards of varying construction for circular saws are exhibited. To consider them singly would lead too far. Suffice it therefore to say that all have for their object the protection of the operator against the many serious accidents which are liable to occur by careless operation or from various other causes. Guards for band saws, for jointers and wood shapers, are also presented, and practical shaft attachments for putting on or taking off belts from pulleys. Emery wheels and grindstones are shown provided with safety hoods, flanges, and other appliances.

The importance of furnishing operators in factories with means by which the motive power, in case of accident, may be quickly disconnected, is the subject of chap. v, and figs. 206 and 207 exhibit two designs for this purpose. Many accidents occur in oiling, cleaning, or repairing running machinery, and chap. vi. is given to directions for personal safety while so employed. Fire precautions, fire escapes, and fire extinguishers are the subjects of chap. vii and a formula is given by which to arrive at the number of exits and stairways required for a workroom in order to get a given number of persons out of the building in case of fire. The installation of electrical machinery, generators, accumulators, and transformers has been considered in chap. viii ; and section 18 of the factory law, prescribing the style of dress to be worn by operators of machinery, is related in chap. ix. Chaps. x to xiii treat of dangers from burning or scalding by chemicals, molten metals, and steam ; instructions are given how to handle inflammable material and explosives, to guard against steam boiler explosions or those of gases, chemical compounds, and gases in blast furnaces, as also against asphyxiation in chemical industries. Laws regulating the employment of women and children are the contents of chap. xiii. The weight which a child of given age is allowed to carry, to move on a push-cart, or by wheelbarrow, is fixed by legal status.

In chap. xiv the author has collected opinions of different government inspectors of the French Republic as to the effectiveness of the present labor regulations and recommendations for improvements. Instructions as to what to do in case of accidents, or first aid to the injured, close the work—a matter which deserves wide circulation in factories and workshops.

On one point M. Razous's scheme is open to objection. In safeguarding machinery there is danger of overdoing things, thereby not only impairing the usefulness of the machine, but at the same time making the employee careless as to his own safety, and so defeating the purpose of the whole.

The various safety devices for circular saws, presented in this book, for instance, have fully attained the purpose of guarding the saw, but the man behind such a machine simply has become an automaton. An American woodworker would rather quit his job than to work on a saw with such incumbrances. What he wants is a good and solid table, a true running saw with teeth set to suit his work and sharp cutting edges, and an adjustable steel splitter back of the saw with an

adjustable short steel guard reaching forward over the saw's circumference, put there for the purpose of arresting any piece that might be hurled from the saw. He wants to see the object upon which he is working and he realizes that his watchfulness is the best safeguard. A jointer guard to which an American woodworker will not object has yet to be invented. A good table, true and sharp knives, and a light adjustable side gauge are sufficient protection to him. The danger lies rather in the desire to replace the skilled workmen by unskilled labor, and a first preventive against accidents on high-speed machinery should be legal prohibition against employing unskilled persons on them.

Nevertheless, this work cannot fail to be highly appreciated by the manufacturers of France, factory superintendents, and employers' liability insurance companies. It is worthy to rank with the *Atlas de Mulhouse* and the bulletins of the Association des Industriels de France contre les accidents. It will give employers valuable information which, if followed out, will aid in reducing the number of accidents to the men behind the machine.

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Le developpement économique de la Russie. Par J. MACHAT. Paris: Librairie Armand Colin, 1902. 8vo, pp. xvi + 311.

RUSSIA has within the last decade sprung into prominence as an industrial country and a field for foreign investors. To satisfy the interest of the western public in her natural resources and economic opportunities, the Russian government published a volume of statistics and descriptive matter in French for distribution at the Paris exposition of 1900. The information contained in that volume forms the basis of the work of the French author; this has been supplemented by a few other official publications and magazine articles in French, German and English. Of the authors perused should be mentioned Professor Schulze Gaevernitz, who is familiar with the Russian language, has lived in Russia and is recognized as a thorough student of Russian conditions. To the student who reads German and French Mr. Machat's book offers nothing that is not as easily accessible in the sources from which he has borrowed. There is no attempt to scrutinize the official material given to the public by the Russian ministry of